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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,363	04/16/2004	Han Sang Lee	8733.1030.00-US	8107

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EXAMINER	
WALTHALL, ALLISON N	

ART UNIT	PAPER NUMBER
2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/825,363	LEE ET AL.	
	Examiner	Art Unit	
	ALLISON WALTHALL	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-11,13,14 and 16-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-11,13,14 and 16-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. The amendment filed on March 31, 2010 has been entered. Claims 1, 5-11, 13-14, and 16-19 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 5-11, 13, 14, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naito (US Patent 6,462,735) in view of Kang (US Publication 2002/0063666), Mizukoshi (US Patent 6,919,691), and Jun (EP 1638071 A2)

As to **claim 1**, Naito discloses an electro-luminescence display device (see column 17, lines 16-23) comprising: R, G and B cells having different light-emission efficiencies (see figure 3 and column 9, lines 48-53);

a timing controller for generating a gate control signal and a data control signal (scanning circuit 420 and data drive circuit 430 respectively), wherein the timing controller includes a look-up table (i.e. conversion table, see column 11, lines 16-23) which receives Red, Green, and Blue N-bit (e.g., 8 bit) digital data signals having a same gray scale value (i.e. one of 0-255 is input),

and converts the Red, Green, and Blue N-bit digital data signal into Red, Green, and Blue M-bit (e.g., 9 bit or 10 bit) digital data signals respectively, wherein each of N and M is an integer and M (e.g., 9 or 10) is greater than N (e.g., 8) (see col.10, lines 15-22); and

gray scale values of the Red, Green, and Blue M-bit digital data signals are different from each other (i.e. see figure 4—when a luminance of 128 is input for R, G, and B, the R, G, and B, output values on the V-T curves are different from each other)

a data driving circuit (300) supplies the Red, Green, and Blue analog data signals to respective Red, Green, and Blue pixels (see column 8, lines 52-57).

Naito does not teach a gamma voltage generator which receives the Red, Green, and Blue M-bit digital data signals and generates a plurality of gamma voltages corresponding to the Red, Green, and Blue M-bit digital data signals and a data driving circuit which generates Red, Green, and Blue analog data signals corresponding to the plurality of gamma voltages responding to the data control signal; and wherein each of the R, G, and B cells has a cathode electrode, an anode electrode, and an emitting layer interposed between the cathode electrode and the anode electrode.

Kang (figure 9) teaches a gamma voltage generator which receives Red, Green, and Blue M-bit digital data signals (D0-D5) and generates a plurality of gamma voltages (95) corresponding to the Red, Green, and Blue M-bit digital data signals, and a data driving circuit which generates Red, Green, and Blue analog data signals (96 is a DAC) corresponding to the plurality of gamma voltages responding to a data control signal (see [0053-0055]). It would have been obvious to one having ordinary skill in the art at

the time the invention was made to include the gamma voltage generator of Kang in the device of Naito to improve display quality.

Mizukoshi teaches an electroluminescent display device wherein each of Red, Green, and Blue pixels includes a cell which has a cathode electrode, an anode electrode and an emitting layer disposed between the cathode electrode and the anode electrode (see column 1, lines 22-51 and column 4, lines 17-28). It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the cells with a cathode electrode, emitting layer, and anode electrode as taught by Mizukoshi, in the electroluminescent device of Naito (column 17, lines 19-22) as modified by Kang, in order to provide self luminous pixels.

Naito, Kang, and Mizukoshi do not specifically teach the Red, Green, and Blue M-bit digital signals corresponding to each N-bit digital data signal are selected to provide a constant white balance. Jun teaches Red, Green, and Blue M-bit digital signals corresponding to each N-bit digital data signal are selected to provide a constant white balance (see figure 3 and paragraphs [0014-0015]). It would have been obvious to one having ordinary skill in the art to provide constant white balance when converting n-bit signals to m-bit signals as taught by Jun in the device of Naito as modified by Kang and Mizukoshi, in order to display the image in the desired color.

As to **claim 11**, Naito discloses a method of driving an electro-luminescence display device (see column 17, lines 16-23) including R, G and B cells having different light-emission efficiencies (see figure 3 and column 9, lines 48-53), the method comprising:

receiving Red, Green, and Blue N-bit (e.g., 8 bits) digital data signals having a same gray scale value (see column 8, lines 65-67);

converting the Red, Green, and Blue N-bit digital data signal into Red, Green, and Blue M-bit (e.g., 9 bit or 10 bit) digital data signals respectively using a timing controller, wherein each of N and M is an integer, M (e.g., 9 or 10) is greater than N (e.g., 8) (see column 8, line 63-column 9, line 5) and gray scale values of the Red, Green, and Blue M-bit digital data signals are different from each other (i.e. see figure 4—when a luminance of 128 is input for R, G, and B, the R, G, and B, output values on the V-T curves are different from each other);

applying the Red, Green, and Blue analog data signals to respective Red, Green, and Blue pixels (see column 8, lines 52-57).

Naito does not teach generating a plurality of gamma voltages corresponding to the Red, Green, and Blue M-bit digital data signals; generating Red, Green, and Blue analog signals corresponding to the plurality of gamma voltages; wherein each of Red, Green, and Blue pixels includes a cell which has a cathode electrode, an anode electrode and an emitting layer disposed between the cathode electrode and the anode electrode.

Kang (figure 9) teaches generating a plurality of gamma voltages (95) corresponding to Red, Green, and Blue M-bit digital data signals (D0-D5), generating Red, Green, and Blue analog data signals (96 is a DAC) corresponding to the plurality of gamma voltages (see [0053-0055]). It would have been obvious to one having

ordinary skill in the art at the time the invention was made to include the gamma voltage generator of Kang in the device of Naito to improve display quality.

Mizukoshi teaches an electroluminescent display device wherein each of Red, Green, and Blue pixels includes a cell which has a cathode electrode, an anode electrode and an emitting layer disposed between the cathode electrode and the anode electrode (see column 1, lines 22-51 and column 4, lines 17-28). It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the cells with a cathode electrode, emitting layer, and anode electrode as taught by Mizukoshi, in the electroluminescent device of Naito (column 17, lines 19-22) as modified by Kang, in order to provide self luminous pixels.

Naito, Kang, and Mizukoshi do not specifically teach the Red, Green, and Blue M-bit digital signals corresponding to each N-bit digital data signal are selected to provide a constant white balance. Jun teaches Red, Green, and Blue M-bit digital signals corresponding to each N-bit digital data signal are selected to provide a constant white balance (see figure 3 and paragraphs [0014-0015]). It would have been obvious to one having ordinary skill in the art to provide constant white balance when converting n-bit signals to m-bit signals as taught by Jun in the device of Naito as modified by Kang and Mizukoshi, in order to display the image in the desired color.

As to **claim 5**, Naito teaches wherein the gray scale value of the Red M-bit digital data signal is greater than the gray scale values of the Green and Blue digital data signals (see figure 4—the R curve is the uppermost curve, so at an input level of 128, the output gray scale value, DATA OUT, of red is larger than that of blue or green).

As to **claim 6**, Naito teaches wherein the gray scale number of the Green M-bit digital data signal is greater than the gray scale number of the Blue digital data signal (see Fig. 4).

As to **claim 7**, Naito teaches wherein the Red analog video signal applied to the respective pixel has a voltage level ranged in 0V to 5V (Fig 3 and see col. 10, lines 50-52).

As to **claim 8**, Naito teaches wherein the Green analog video signal applied to the respective pixel has a voltage level ranged in 0V to 2.5V (see Fig. 3 and col. 10, lines 50-52).

As to **claim 9**, Naito teaches wherein the Blue analog video signal applied to the respective pixel has a voltage level ranged in 0V to 1.9V (see Fig. 3 and col. 10, lines 50-52).

As to **claim 10**, Naito teaches an electroluminescence display (see column 17, lines 16-23), thus it is obvious each of the pixels is an electro-luminescence cell.

As to **claims 13, 14, and 16-19**, these claims are analyzed similar to claims 5, 6, and 7-10, respectively.

Response to Arguments

4. Applicant's arguments with respect to claims 1 and 11 have been considered but are moot in view of the new ground(s) of rejection. In view of amendments, the reference of Jun has been added for new grounds of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALLISON WALTHALL whose telephone number is (571)270-3571. The examiner can normally be reached on Mon-Fri 9:30-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on (571)272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

anw
April 23, 2010

/Chanh Nguyen/
Supervisory Patent Examiner, Art Unit 2629